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ABSTRACT

The TeleCampus online database, a project of TeleEducation NB (New Brunswick), aims to be the world's leading World Wide Web site for students seeking information about online courses and programs and for educational institutions and training companies wishing to promote their offerings. It is a comprehensive multilingual database of courses and programs available worldwide on the Internet, including primary, secondary, community college, university, and specialized training courses. The database is limited to only those courses that can be taken fully online from anywhere in the world that has an Internet connection. An analysis of the available courses demonstrates that nearly 80% of these courses originate in the United States. More than 44% are at the university level, and fully 96% are in English. Sections of this paper present: (1) background on the TeleCampus initiative; (2) an online course and program taxonomy that includes courses with no or limited distance availability, correspondence courses, computer-mediated conferencing, and hypermedia on the Web; (3) database description; and (4) rationale, i.e., an analysis demonstrating the need for the TeleCampus database, as well as its sustainability and profitability. (Author/AEF)

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TeleCampus On-line Course Database

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Abstract: *The TeleCampus* on-line database aims to be the world's leading WWW site for students seeking information about on-line courses and programmes, and for educational institutions and training companies wishing to promote their offerings. It is a comprehensive multilingual online database of courses and programmes available worldwide on the Internet including primary, secondary, community college, university and specialised training courses. The database is limited to only those courses that can be taken fully on line from anywhere in the world that has an Internet connexion. An analysis of the available courses demonstrates that nearly 80% of these courses originate in the United States. More than 44% are at the university level. Fully 96% are in English. Other statistics are available. Interested parties can view the database at http://database.telecampus.com

Introduction

The TeleCampus online course database (http://database.telecampus.com) is a project of TeleEducation NB. It has implemented as a comprehensive online course database sponsored by Industry Canada, the World Bank, the Commonwealth of Learning, Le centre international pour le développement de l'inforoute en français, and other organizations. The online course database is a central repository of course information for students. Prior to the existence of the online course database, students wishing to access courses had to do some sophisticated searching. The on-line course database is the focus for any students wishing to take on-line courses as well as for any institutions and companies that wish to make their courses accessible.

Presently, there are more than 7 000 fully Web-based courses on line. In two years, we believe there will be more than 20 000. By being the first to establish a comprehensive on-line course database, we hope to capture the loyalties of students and institutions and become the world's on-line course centre. Educational institutions and training companies from many different countries are beginning to offer courses and programmes on line using the World Wide Web. Students can now take these courses from anywhere that has an Internet connection, without being bound to any specific time, place or institution.

Background

The *TeleCampus* initiative was approved by the Regional Development Commission of the Province of New Brunswick (RDC). *The TeleCampus* is managed by TeleEducation NB, the provincial distributed distance learning network, a section of the Department of Education. *The TeleCampus* included the on-line course database project as part of its original marketing strategy. The on-line course database, which was originally envisioned as a marketing tool, is seen now also as a possible for-profit venture which attracts not only students and institutions but also external funding through advertising and investment capital.

This initiative is also seen in the context of the national strategy to prepare Canadians to meet the challenge of globalization. This is outlined in the Canadian government's action plan [Government of Canada 1992], where it is recommended that Canadian educational institutions and training organizations should market more extensively in other countries emphasizing niche areas like distance education and information technology in which Canada excels [Industry Canada 1997].

The *TeleCampus* now hosts and maintains a comprehensive multilingual online database of courses and programmes available worldwide on the Internet including primary, secondary, community college, university and specialised

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training courses. It has been initially developed and designed in English and French. It will be extended to other language users as partnerships develop with institutions abroad.

As of spring, 1998, nearly 78% of the courses originated in the USA. Canada was the place of origin for 18% followed by the UK (2%) and Australia (1%). Other countries with online courses include France, South Africa, Sweden, Ireland, Japan, New Zealand, Belgium, and Bangladesh. Nearly 44% of courses were from universities. Community colleges accounted for 16%, K12 (11%) and more than 25% were from the private sector. More than 96% of courses were in English, 3.7% are in French and only 0.3% in other languages.

On-Line Course and Program Taxonomy

An on-line programme or course is defined as one that can be followed completely on line. This does not mean that all course materials need be on line. Books, CD-ROMs, video and audio tapes, laboratory materials etc. could be shipped out directly to students. Examinations may be taken at local institutions or testing centres. The database excludes courses with no on-line component as well as those that require residency.

On a continuum, the courses and programmes that are advertised on line continue thus:

Courses with no or limited distance availability:

1. Classroom-based courses with no on-line features;
2. Classroom-based courses with some materials available on line;
3. Classroom-based courses that integrate on-line materials;
4. On-campus courses that are on line but are not available to distant students;
5. On-campus courses toffering limited access to students at a distance (often limited to one region)
6. Teleconferencing courses where students must participate from specified learning centres.

These represent the majority of courses presently advertised. They are not included in the database because they require residency, either on campus or near an accessible learning centre.

Correspondence Courses (print, audio and video tapes, software)

7. Print-based correspondence courses using the postal system with minimal student support;
8. Print-based correspondence courses with continuing access to a tutor by telephone.

These also would not be included, as they are not available on line.

All of the following class of courses are included in the on-line course database:

9. Print-based correspondence courses also using email for tutor access;
10. Correspondence courses with course content available on line in electronic format.
11. CBT- based self-study courses with access on-line to an instructor.
12. CBT- based self-study courses with no instructor.

These courses represent the most primitive form of on-line courses.

Computer-Mediated Conferencing (CMC)

These courses often include texts and sometimes include audio/video tapes, and computer software possibly including Computer-Based Training courseware. Students may need to download and install client-side software to participate.

13. Courses that use email for submission of assignments and private tutoring and email lists or listservs for discussions and tutoring;
14. Courses that use CMC software for discussions as well as email for submission of assignments and private tutoring;
15. CMC courses with all content, audio/ video, and software available on line; students can download and print out content or read it on line.

Hypermedia on the World Wide Web

These courses can be followed on line on the World Wide Web. They take advantage of the links to other relevant sites using subject trails and other techniques. These courses can be either text-based (and so available to students with older computers and/or low bandwidth connections) or they can include graphics and animations that require a more powerful computersd and higher bandwidth.

16. Courses that use hypertext links and have all necessary course materials on line.
17. Courses with hypermedia links with Multimedia using *Shockwave*, or other applications.

On-line courses need to be further divided into those in which the course materials can be accessed using a standard web browser (Netscape or Internet Explorer) and those that require students to download and/or install a client-side application. This can be quite troublesome for students. Some plug-ins like *Shockwave* and *Quicktime* are becoming standard and might be considered as normally available. Others however are non-standard and can be problematic.

Various permutations of the taxonomy described are possible. For example any Multimedia web course might also have a text component. A CMC course could have some hypermedia links and a workbook. A correspondence course could incorporate some multimedia courseware on a CD-ROM with hyperlinks to the World Wide Web.

In order to limit the size of the database and make it more useful to on-line students, this project limits the course selection to those courses and programmes that are universally available on line. That is, those that can be taken from anywhere in the world where there is an Internet connection. If a student is in Johannesburg, Rio de Janeiro or Kuala Lumpur and has a reliable Internet connection, he or she should be able to enroll in any course in the database.

Database Description

The database provides a full-text search engine for users who can search using categories such as Programme, Course, Level, Institution, Country, Region of Country, State/Province etc. A Subject list is also present for students who wish to search by category. For example: Biology, Architecture, Classics, Computer Technology. For more detailed information, users are directed to the institutional web sites. The aim is to keep the database as simple and useful as possible for users. It has been implemented in Oracle 7.6 in a robust web-accessible, multi-user environment. The database is open so additional fields can be added as needed.

The fields conform to *ISO Standard 11179* as developed by EduCAUSE's Instructional Management Systems Project (http://www.imsproject.org/) As such, each field contains the following metadata attribute descriptions: *Name, Definition, Obligation* (whether or not the field is mandatory, conditional or optional), *Data type* (string, alphanumeric, etc.), *Length* (number of characters), *Default value, Permitted values, and Comments*.

In addition, student support pages and tutorials are included, for example: counseling students on the attitudes and aptitudes needed for on-line study; basic on-line study skills; the implications of accreditation; student aid links; links to on-line resources for students; on-line library links etc. A student CMC discussion area, and a listserv open to all on-line students is also being made available. A WWW form is supplied for institutions to input information on their courses and programmes according to the standard format. Institutions are encouraged to use it.

Rationale

A normal analysis would not be particularly useful for *the TeleCampus* on-line course database initiative, as we are projecting into a future that has no precedent with few comparisons. The exponential growth in activity of all kinds on the Internet is however leading to increased demands for on-line education and training. The number of courses available on line has increased from less than fifty in 1996 to close to one thousand last year. More than ten thousand could be online by 1999, and over one hundred thousand by 2005. This represents an increase in the number of students from less than a thousand to more than a hundred thousand in 1999, to more than a million by 2005. In addition, untapped world wide markets are only now developing. Any estimate of market size will be in error, and any attempt at a "snapshot" of the market at any particular time will be outdated on the following day. Undoubtedly, students need a user-friendly service for accessing these course offerings as well as both specific and general information about courses, institutions, accreditation, distance learning, and studying on line.

Although it is difficult to gauge the commercial potential of on-line educational databases, we can check out on-line businesses that specialise in various niche products. They are among the few that are making any money on line. Noticeable exceptions are the various search engines like Yahoo, Excite and Alta Vista. Their large critical mass of users attracts advertisers who can target specific markets depending on the search terms entered by the users [Hagel & Armstrong 1997].

Many successful sites (not necessarily money making) are based on creating a focal point for specific content created by the owner. For example, Phil Greenspun's site (http://www-swiss.ai.mit.edu/wtr/) [Greenspun 1997]. Others like the *Training Supersite* (http://www.trainingsupersite.com), and *Travel.com* (http://www.travel.com) collect links to other relevant sites. Other sites provide a valuable service like Don Stroud's collection of downloadable utilities and reviews (http://cws.internet.com/) or *Amazon* "the world's largest bookstore" which will find any book that is requested.

One key to creating a successful site seems to be reaching a critical mass of users with a particular profile that is attractive to advertisers. The more information and services a company provides, the more likely it is to attract the number of users that will make a site commercially viable. The challenge for *the TeleCampus* is to create a dynamic resource attractive to the ever increasing number of people who are exploring the possibilities for on-line learning.

One strategy is to aggregate vendors and users under a common umbrella, and create an on-line centralised information and service centre providing convenient access to a wide variety of vendor products and services. See Pennwell Media's *Broadband Guide* (http://www.broadband-guide.com/) for broadband professionals or Jumbo Inc.'s *Jumbo* web site (http://www.jumbo.com) for shareware customers and vendors. "Prominence – not dominance is the rule." Chuck Martin (1997, p.188) reminds us. Value is created when specific types of users and resources of interest to them are aggregated

These sites serve as magnets, bringing together customers who possess common purchase profiles. The sites attract a significant percentage of the buyers in any niche area. Thousands of these sites are attracting people because they are providing a structure that makes it convenient for customers to access information about, and purchase, the products that they desire. These magnet sites provide customers with more facts about particular niche areas than they could possibly access otherwise. New customer power bases are developing based on the large numbers congregating in electronic centres. The site serves as an agent for the users who frequent it. It can defend their interests and influence vendors to ensure that they augment their services. For example, "reverse markets" are now possible where customers, armed with information can coax or cajole vendors into bidding for the opportunity to sell their products and services.

Visitors are the principal economic asset of these sites. The value of a site increases exponentially once a critical mass of visitors is attained. This can take some time and no doubt will not happen right away. However, as more people visit, more are attracted. This can lead to a reinforcing cycle of activity that compounds the number of users causing a massive surge in user growth. These new users contribute even more content and increase the value of the site further which again leads to even more users.

However, initially there can be an extended period of linear growth before the exponential reinforcement cycle sets in. As a consequence, investors in WWW sites cannot expect a quick return on investment. If one charges user fees, then this could stunt growth and make reaching a critical mass of users impossible. Advertisers may not be interested until the critical mass is reached. Therefore, near term revenues should not be expected. A site either generates a large amount of traffic or provides vendors with valuable information on a limited number of users. Either one will take time to gather.

As users represent the primary asset of a WWW site, a conscientious way to attract and keep them is to advocate their interests. A successful site leverages the power generated by the users to give them an advantage. Shared information about vendors' products, ratings, and access to a wide range of choice are some of the ways in which users can benefit. In addition, as an agent for users, fighting for their interests, a site becomes a focal point for the exchange of information of relevance to the group. Value is then derived from the opportunities to sell to the niche audience and to sub-niches of specific information seekers. Detailed transaction profiles can be generated and sold to vendors.

Microsoft, *NCSA Mosaic* (the predecessor to Netscape) and other companies provide us with textbook examples of the consequences of exponential growth. The *Mosaic* browser was created by Marc Andreesen and other students at the University of Illinois and was distributed free-of-charge to anyone who wanted to use it. The key creators then teamed with businessman Jim Clark to create *Netscape*, an even better browser which was again distributed freely. It went on to capture over 90% of the market. *Netscape* then started to charge for their product while providing it free to educational institutions. Capitalising on their reputation, and the critical mass of users of their browser, *Netscape* attracted investors and developed revenue streams from selling their server and other software to businesses, and from advertisers attracted by the high volume of visitors to the *Netscape* Web site. (http://www.netscape.com)

Yahoo! is one of the Web's leading search engines. It was developed by Jerry Yang and David Filo when they were graduate students at Stanford in 1994. It was one of the first tools that helped users access in a structured fashion the vast amounts of data becoming available on the WWW. It was made freely available to all users and has continued as a free service. When a critical mass of users was reached after a relatively short period of time – less than two years - investors and advertisers became interested and helped to turn it into a profitable enterprise. (http://www.yahoo.com)

Both *Netscape* and *Yahoo!* took full advantage of the features of the WWW environment to expand their businesses. Rather than waiting until a perfect product was created, they distributed imperfect *beta* versions and learned from the feedback provided by users. Their research was conducted through their early releases. They put their products out quickly without relying on long discussions, consulting, meetings, strategic plans and creating rigid structures. They made

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alliances from the beginning and remained fluid rather than adhering to a fixed business plan. They rely heavily on the technical proficiency, adaptability and abilities of their staff.

Growth on the net mimics nature, proceeding linearly until it reaches a critical point, after which the accomplishments begin to foster even more successes. Once DOS and HTML became accepted as standards, their growth took off. In the information technology arena, even more than in other fields, the rich get richer [Kelly 1997].

A WWW niche site must also attract a critical mass of visitors before it will "take off" and grow exponentially. Established sites discourage others from entering the field, so those who get in first and attain critical mass quickly will pre-empt competitors. Those who enter early become entrenched. A "lock-in" occurs based on their unique assets. Users do not like to switch from the known and familiar. A much larger investment is needed to catch up with and exceed the quality of the established business. The price of start-up is simply too great for all but the most serious competitors. Those who attempt to set up later find it to be prohibitively expensive. While niche WWW sites do not require large capital investments in the beginning stages of an industry, indomitable barriers make it increasingly more difficult for those who start later [Martin 1997].

The best technologies whether hardware or software get cheaper every year. The price of telecommunications bandwidth is also dropping rapidly. This drop in prices resembles an asymptotic curve that continually approaches zero without ever reaching it. Similarly, on the web, businesses are successful by offering products and services for free. When one product is free, other products and services can be positioned around it for sale.

Usage and transaction information capture is likely to be a major engine for economic growth. Successful on-line businesses develop deep skills early in the extraction of commercial value from member usage and transaction profiles. However, they use this information to develop the position of champion of their users' interests rather than as a representative of the vendors. By adopting this position, the site organiser becomes a protector of the users' usage and transaction profiles and not a conscious surrogate of the vendors.

This analysis suggests that there is a role for *the TeleCampus* on-line course database as a central virtual meeting place for students and institutions, and that a business case can be made for ensuring its sustainability and profitability. Other sites that offer indexes of courses offer access to a wide range of on site, online or videoconferencing courses. Students afe often frustrated when they find a course they want only to discover that there is a residency requirement or that there is another stipulation that makes it difficult to take online. There is a listing of other indexes available at the TeleEducation NB website (http://teleeducation.nb.ca).

Conclusion

The potential need for *the TeleCampus* on-line course database is enormous. On-line learning is a growth industry. Compare this database initiative with another one like Yahoo!, which started out as a fun tool created by students. The potential was seen by investors, who worked with the original team to turn it into a successful commercial enterprise. It is now a multimillion dollar operation. The world student population is huge. As more and more of them become attracted to on-line learning possibilities, they will be searching the Net for courses. Our database will attract them. Advertisers will want to reach them. In addition, this database can be seen as a worthwhile economic aid project as it benefits students and organisations from all over the world. The service is offered to students free of charge. Basic listing by institutions is also available free of charge.

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